IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS:	Examiner: M. Meky
Michael E. Tompkins, et al.	Art Unit: 2757
CONTINUATION OF SERIAL NO.: 08/822,179	**Express Mail Label No. EL590183161US**
FILED: March 20, 1997	
TITLE: SPA CONTROL SYSTEM	
DATE: January 16, 2001	

PRELIMINARY AMENDMENT

BOX PATENT APPLICATION
Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

The captioned application is a continuation under 37 C.F.R. § 1.53(b) of U.S. Serial No. 08/822,179, filed March 20, 1997. Before action, please amend the captioned application as follows:

IN THE SPECIFICATION

At page 1, line 2, after "This application is a continuation of", please insert --U.S. Patent Application Serial No. 08/822,179 filed March 20, 1997, which is a continuation of U.S. Patent Application No. 08/703,177 filed August 23, 1996, which is a continuation of ...--

Page 3, line 7, strike "interconnection" and insert therefor --interconnection--.

Page 3, line 16, after "spa control system", insert the following paragraph:

--FIGURE 14 illustrates diagrammatically a system constructed in accordance with the preferred embodiment--.

Page 3, line 21, strike "(not shown)".

Page 3, line 27, strike "Figure 1" and insert therefor --Figures 1 and 14--.

Page 3, line 29, strike "interconnection" at its first occurrence and insert therefor --interconnection--.

Page 3, line 29, strike "innerconnection" at its second occurrence and insert therefor --interconnection--.

Page 3, line 31, strike "at".

Page 3, line 31, strike "a" and insert therefor --as--.

Page 3, line 31, after "20," insert --21,--.

Page 3, line 31, after "pH", insert --22--.

Page 3, line 32, delete "22".

Page 4, line 2, strike "(not shown)" inset therefor --29--.

Page 4, line 15, strike "current image" insert therefor --calibration values--.

Page 4, line 29, after "conditioning" insert --at--.

Page 4, line 31, between "temperature" and the comma, insert --21--.

Page 4, line 32, strike "(both labelled 20)" and insert therefor --20--.

Page 6, line 8, after "block" insert --38--.

Page 6, line 18, after "1", insert --, 2--.

Page 6, line 18, strike "6" and insert therefor --5--.

Page 6, line 22, strike the numeral "50" and insert therefor --48--.

Page 6, line 30, strike "blower" and insert therefor --pump--.

Page 6, line 30, strike "pump" and insert therefor --blower--.

Page 6, line 31, after "isolated" insert --at--.

Page 7, line 1, strike "innerconnection" and insert therefor --interconnection--.

Page 7, line 3, strike "innerconnection" and insert therefor --interconnection--.

Page 7, line 5, strike "innerconnection" and insert therefor --interconnection--.

Page 7, line 7, after "Interlock" insert --63--.

Page 7, line 9, after "device" insert --64--.

Page 8, line 2, after "20," insert --21,--.

Page 8, line 8, after "20," insert --21,--.

Page 8, line 11, strike "small" and insert therefor --low--.

Page 8, line 11, after "20," insert --21,--.

Page 8, line 30, strike "46" and insert therefor --40--.

Page 8, line 32, strike "46" and insert therefor -40--.

Page 9, line 18, after "20" insert --, 21--.

Page 9, line 18, strike "26" and insert therefor --29--.

Page 9, line 20, between "20" and "of" insert --, 21--.

Page 9, line 22, after "20" insert --, 21--.

Page 9, line 27, strike "*".

Page 10, line 3, strike "5" and insert --6--.

Page 10, line 23, strike "It" and inset therefor --If--.

Page 12, line 2, after "program" insert --104--.

Page 12, line 22, strike "keypad" and insert therefor --keyboard--.

Page 12, line 24, strike "keypad" and insert therefor --keyboard--.

Page 12, line 31, after "LED" insert --52--.

Page 12, line 32, after "key" insert --50--.

Page 12, line 34, after "screen" insert --46--.

Page 13, line 2, after "display" insert --40--.

Page 15, line 16, after "temperature" insert --21--.

Page 15, line 19, after "temperature" insert --20--.

Page 20, line 3, strike "CTLACT - Routine".

Page 20, line 15, strike "CTLERR - routine" at its first occurrence.

Page 20, line 20, strike "CTLKEY - Routine".

Page 20, line 26, strike "The Module CTLLEDS - Routine CTLLEDS - ".

Page 20, line 26, strike "if" and insert --If--.

Page 20, line 27, strike "CTLLEDS".

Page 20, line 27, strike "when" and insert --while--.

Page 21, line 1, strike "Delay - Routine" at its first occurrence.

Page 21, line 3, strike "DELTIME - Routines".

Page 24, line 3, strike "Learn - Routine" at its first occurrence.

Page 24, line 29, strike "MYREGS - Routine".

Page 25, line 3, strike "give".

Page 25, line 9, strike "POWRFAIL - Routine".

Page 25, line 22, strike "ROMTEST - Routine".

Page 25, line 23, after "program" insert --EPROM or other--.

Page 26, line 9, strike "hysteris" and insert therefor --hysteresis--.

Page 26, line 30, strike "Routine".

Page 27, line 11, strike "TIMEBIN - Routine".

Page 27, line 13, between "Routine" and "is" strike "Timer".

Page 27, line 18, strike "UNMIL Routine".

Page 27, line 20, strike "an/pm" and insert therefor --am/pm--.

Page 27, after line 35, add the following paragraphs:

--Figure 14 shows one possible configuration of the system of the present invention based

on the above description. A spa, in accordance with normal convention, includes a container 11

for holding water 13 for bathers. The control panel 12 may be at spa side. As has been

previously described, various output devices are installed in the system for the user of the system.

As is well known in the art, conventional output devices include a heater 26, an air blower 28, a

filter 27, lights 30, and a pump 24. Pump 24 may be separate pumps or one pump with a high

and low speed. Heater 26 includes a heating element or heater core 29 for heating the water.

Plumbing is provided with the system such as a plurality of pipes 35 for flowing water to and

from the container 11. The low speed of pump 24 pumps water through pipes 35 causing the

water to pass through filter 27 and heater 26 prior to flowing into container 11. The high speed

of pump 24 flows water at high speeds through jet 37 mounted on container 11. The turbo or air

blower 28 blows air into the water 13.

Various input devices are installed at selected locations within the system of the present

invention and include sensors for detecting various parameters of the water and the system. Such

sensors include the flow rate sensor 18, the temperature sensor 20 measuring the temperature of

the water at the heating element 29, the temperature sensor 21 measuring the temperature of the

water in the container 11, and a pH probe 22 measuring the pH of the water in the container 11.

As has been previously described, the input devices are connected to a system interconnection

panel 14 which is connected to the control panel 12 and microprocessor 10 for receiving output

signals from the various input devices. The system interconnection panel 14 is also connected to

the various output devices for sending input signals to the various output devices.--

Page 28, lines 14 and 15, strike "49" and insert therefor --24--.

Page 28, line 17, after "element" strike "(in 220v, in" and insert --in 220v (in--.

Page 28, line 27, strike "59," and insert therefor --65--.

Page 28, line 28, strike "50" and insert therefor --61--.

Page 28, line 28, after "heating" insert --59--.

Page 28, line 28, strike "61" and insert therefor --67--.

Page 28, line 30, strike "46" and insert therefor --40--.

Page 29, line 1, after "thermostat" insert --43--.

Page 29, line 7, strike "46" and insert therefor --40--.

Page 29, line 11, strike "Figure" and insert --Figures 4 and--.

Page 29, line 12, after "reset" insert --at--.

Page 29, line 14, strike "100" and insert therefor --104--.

Page 29, line 16, strike "100" and insert therefor --110--.

Page 29, line 19, after "scanner" insert --82--.

Page 29, line 20, strike "32".

Page 29, line 20, strike "7" and insert therefor --2--.

Page 30, line 10, strike "50" and insert therefor --61--.

Page 30, line 10, strike "50".

Page 30, line 11, strike "46" and insert therefor --40--.

Page 30, line 13, strike "50" and insert therefor --61--.

Page 30, line 16, strike "50" and insert therefor --61--.

Page 30, line 19, strike "50" and insert therefor --61--.

Page 30, line 21, strike "50" and insert therefor --61--.

Page 30, line 23, strike "46" and insert therefor --40--.

Page 31, line 5, strike "46" and insert therefore --40--.

Page 31, line 17, after "switch" insert --31--.

Page 31, line 18, strike "innerconnection" and insert therefor --interconnection--.

Page 31, line 18, strike "54 in" and insert therefor --48 and--.

Page 31, line 19, after "display" insert --40--.

Page 31, line 31, strike "46" and insert --40--.

Page 33, line 2, delete "not shown", and insert therefor --such as temperature sensor 20--.

Page 33, line 4, delete "not shown" and insert therefor --such as temperature sensor 21--.

IN THE CLAIMS:

Please cancel claims 1-34 without prejudice and add the following new claims 35-58.

--35.   A control system for a water spa intended to remain substantially continuously filled between uses, comprising:

an electrical power source for providing energy;

a system interconnection panel in communication with the power source, the system interconnection panel including a step-down power supply and a microcomputer; and

a plurality of electronic and electrical components connected to the system interconnection panel, including an electronic control panel capable of displaying alphanumeric characters calculated by the microcomputer--.

--36.   The spa control system of claim 35, wherein the step-down power supply included with the interconnection panel converts energy supplied by the power source into a lower power and a lower voltage as required by one or more of the electronic components connected thereto--.

--37. The spa control system of claim 35, wherein the spa control system is intended for use on an outdoor spa vessel--.

--38. The spa control system of claim 37, wherein a Ground Fault Circuit Interrupter (GFCI) is connectively interposed between the electrical power source and the system interconnect panel--.

--39. The spa control system of claim 35, wherein one of the electrical components is a heating element, and another of the electrical components is a pump--.

--40. The spa control system of claim 39, wherein the heating element is an electrical resistive heating element and operates to heat water held by the spa--.

--41. The spa control system of claim 35, the spa control system further comprising an electronic circuitry associated with the microcomputer and being capable of converting analog signals to engineering units expressed as alphanumeric characters--.

--42. The spa control system of claim 35, the spa control system further including at least one electronic solid state temperature sensor to measure the temperature of water in the spa, and a second electronic sensor to measure another parameter of water in the spa--.

--43.   The spa control system of claim 42, wherein the temperature sensor produces an electronic signal proportional to the temperature of water in the spa, and the second sensor produces an electronic signal indicative of presence or absence of water flow--.

--44.   The spa control system of claim 43, wherein the microcomputer converts the electronic signals proportional to temperature to engineering units using a curve fitting algorithm--.

--45.   The spa control system of claim 44, wherein the microcomputer is capable of displaying the temperature in alphanumeric engineering units on the control panel--.

--46.   The spa control system of claim 43, wherein an error message is displayed on the control panel in alphanumeric characters when lack of water flow is detected by the second sensor--.

--47.   A water spa for bathing, comprising:

a vessel for holding water and intended to remain substantially continuously filled between uses;

a control system for a water spa intended to remain substantially continuously filled between uses, comprising:

an electrical power source for providing energy;

a system interconnection panel in communication with the power source, the

system interconnection panel including a step-down power supply and a microcomputer; and

a plurality of electronic and electrical components connected to the system

interconnection panel, including an electronic control panel capable of displaying alphanumeric

characters calculated by the microcomputer--.

--48.   The water spa for bathing of claim 47, wherein the step-down power supply

included with the interconnection panel converts energy supplied by the power source into a

lower power and a lower voltage as required by one or more of the electronic components

connected thereto--.

--49.   The water spa for bathing of claim 48, wherein the water spa is intended for

outdoor use--.

--50.   The water spa for bathing of claim 47, wherein a Ground Fault Circuit Interrupter

(GFCI) is connectively interposed between the electrical power source and the interconnect

panel--.

--51.   The water spa for bathing of claim 47, wherein one of the electrical components is

a heating element, and another of the electrical components is a pump--.

--52.   The water spa for bathing of claim 51, wherein the heating element is an electrical resistive heating element and operates to heat water held by the spa--.

--53.   The water spa for bathing of claim 47, wherein the spa control system microcomputer and associated electronic components are capable of converting analog signals to engineering units expressed as alphanumeric characters--.

--54.   The water spa for bathing of claim 47, wherein the spa control system further including at least one electronic solid state temperature sensor to measure the temperature of water in the spa, and a second electronic sensor to measure another parameter of water--.

--55.   The water spa for bathing of claim 54, wherein the temperature sensor produces an electronic signal proportional to the temperature of water in the spa, and the second sensor produces an electronic signal indicative of presence or absence of water flow--.

--56.   The water spa for bathing of claim 54, wherein the microcomputer converts the electronic signals proportional to temperature to engineering units using a curve fitting algorithm--.

--57.   The water spa for bathing of claim 56, wherein the microcomputer is capable of displaying the temperature in alphanumeric engineering units on the control panel--.

--58.   The water spa for bathing of claim 54, wherein an error message is displayed on the control panel in alphanumeric characters when lack of water flow is detected by the second sensor--.
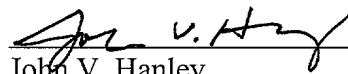
REMARKS

By this paper, original claims 1-34 have been canceled and new claims 35-58 added. Claims 35-58 are pending.

In addition, certain amendments were made to the specification for clarification to correct errors. It is believed that no new matter has been added.

Respectfully submitted,

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